

**UNCLASSIFIED**

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400: Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 1206893C I Space Tracking and Surveillance System (STSS)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	34.907	36.955	-	36.955	37.134	35.617	36.404	37.503	Continuing	Continuing
MD12: Space Tracking and Surveillance System (STSS)	-	0.000	32.015	32.217	-	32.217	34.154	33.671	34.363	35.356	Continuing	Continuing
MC12: Cyber Operations	-	0.000	1.336	2.997	-	2.997	1.359	0.340	0.340	0.446	Continuing	Continuing
MD40: Program-Wide Support	-	0.000	1.556	1.741	-	1.741	1.621	1.606	1.701	1.701	Continuing	Continuing
Program MDAP/MAIS Code: 362												
Note In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.												
A. Mission Description and Budget Item Justification The two Space Tracking and Surveillance System (STSS) satellites launched in 2009 provide an on-orbit capability to validate remote sensor fire control integration to inform design and operation of future Missile Defense Agency (MDA) space-layer capabilities. MDA uses STSS data to characterize contribution of space data into the Ballistic Missile Defense System (BMDS) and to provide sensor measurements and background data supporting trade studies and analyses for future MDA space-layer options for both Homeland and Regional Defense.  STSS continues to provide risk reduction for future MDA space capabilities, models, algorithms, interface definitions, communications architectures, and performance across threat object acquisition, tracking, complex target signatures, discrimination and multi-mission support. STSS also informs the Ballistic Missile Defense System (BMDS) Concept of Operations, timelines and performance requirements for remote space sensor cuing for ballistic missile engagements, expanding battle space for weapon systems such as Aegis Ballistic Missile Defense (BMD).  The STSS program demonstrates the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two STSS satellites are operated from the ground station processing center at the Missile Defense Space Center (MDSC). The STSS satellites demonstrate MDA space-layer capabilities and reduce risk for future systems by viewing high-value Targets of Opportunity and participating in BMDS flight tests.  The MDSC provides MDA's only centralized collaboration and integration environment that leverages existing Overhead Persistent Infrared (OPIR) enterprise integration in support of BMDS research and development test, and sensor operations. The MDSC capabilities and infrastructure support flight tests, operational concept and prototype development, technology demonstrations, experiments, and algorithm development within a multi-security, collaborative environment to integrate and exploit												

**UNCLASSIFIED**

<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2019 Missile Defense Agency	<b>Date:</b> February 2018
---	----------------------------

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>
---	--

national space asset data. The MDSC also conducts studies and experiments with MDA assets such as the Spacebased Kill Assessment (SKA), and STSS, as well as other agencies' assets.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
Previous President's Budget	0.000	34.907	39.453	-	39.453
Current President's Budget	0.000	34.907	36.955	-	36.955
Total Adjustments	0.000	0.000	-2.498	-	-2.498
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• FY 2017 Request for Additional Appropriations	0.000	0.000	0.000	-	0.000
• Missile Defeat and Defense Enhancement	0.000	0.000	0.000	-	0.000
• Other Adjustment	0.000	0.000	-2.498	-	-2.498

**Change Summary Explanation**

Decrease in FY 2019 of \$2.498 million reflects a realignment to PE 0603890C, MC30, for Cyber initiatives as well as other Department of Defense priorities.

# UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>				Project (Number/Name) MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MD12: <i>Space Tracking and Surveillance System (STSS)</i>	-	0.000	32.015	32.217	-	32.217	34.154	33.671	34.363	35.356	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

## Note

In accordance with the 2016 National Defense Authorization Act, Section 1601-Major Force Program and Budget for National Security Space Programs, funding for FY2018 and beyond for PE 0603893C is transferred to PE 1206893C. This move aligns funding to the newly established unified major force program for national security space programs to prioritize national security space activities in accordance with the requirements of the Department of Defense and national security.

## A. Mission Description and Budget Item Justification

Two Space Tracking and Surveillance System (STSS) satellites provide a low earth orbit sensor capability with visible and infrared sensors for integrated testing with other Ballistic Missile Defense System (BMDS) elements. STSS demonstrates space-based capabilities including persistent tracking and integrated BMDS discrimination improvements. These two satellites provide valuable risk reduction for acquisition, tracking, complex scenes, and discrimination functionality to include stereo data fusion, cueing radars over the horizon and over-the-horizon fire control.

The on-orbit sensors collect invaluable background, scene and target signatures to support future MDA space-layer and other weapon sensor development trade studies. STSS activities provide information for integration of space-based missile tracking (midcourse phase); remote sensor and weapons cueing via the Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments. STSS enables early capability assessment to address the Warfighter's need for highly available early missile tracking from space, providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for future MDA space-layer capabilities include detecting and acquiring ballistic missiles; tracking ballistic missiles and their deployed objects; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting ballistic missile and intercept event to close the fire-control loop; filtering reports to C2BMC; and providing near real-time object data to external users. STSS support to other mission areas improves definition for future Enterprise system approaches.

The Missile Defense Space Center (MDSC) provides capabilities and infrastructure to support space operations, integration and testing with the BMDS. It provides a multi-level security environment for sensor data management and integration across space and terrestrial sensor data activities. MDSC experiments leverage DoD and national security space capabilities. MDSC activities support analyses, demonstration and integration of space sensor capabilities into developmental and operational MDA elements. MDSC enables the development of advanced technology and algorithms including fusion of multiple sensor types (radar, overhead persistent infrared, electro-optical and other emerging sensor technologies). It also supports mission integration of space-based missile tracking, sensor and weapons cueing via C2BMC, features and discrimination, kill and impact point assessments into the BMDS and other non-MDA mission areas, including Space Situational Awareness, technical intelligence, and battle space characterization. This effort is a continuation of work previously performed in program element 0603895C that supported the STSS program.

# UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency		Date: February 2018		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)	Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)		
Lessons learned and data gathered from the STSS demonstration satellites program provide valuable information for future MDA space-layer modeling and simulation activities in assessing the capability provided by Overhead Persistent Infrared sensors.				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2017	FY 2018	FY 2019
Title: Demonstration Satellites		0.000	32.015	32.217
Articles:		-	-	-
Description: The STSS demonstration satellites collect and deliver critical space and missile characterization data used to design and inform the BMDS and space-layer future capabilities. The MDSC facilities and activities are required for safe STSS satellite operations and sustainment STSS activities include: - Perform risk reduction for future MDA tracking and surveillance initiatives and OPIR Enterprise integration and demonstrations across OPIR cueing, Joint Tasking Operations, and data utility - Collect data to support joint OPIR mission utility assessments across Space Situational Awareness, Battle Space Awareness, and Technical Intelligence missions to include integration, analyses, and studies to confirm data sharing capabilities - Participate in Integrated Master Test Plan events - Conduct satellite testing to demonstrate critical space capabilities, including: -- Ability to support BMDS integrated discrimination efforts -- Ability to support Hit/Kill assessment from space -- Ability to cue BMDS sensors from space -- Ability to provide precision cue to BMDS sensors - Perform satellite functionality testing and calibration as part of the satellite operations - Conduct missile tracking experiments as identified in the test specific sections - Provide Air Force Space Command Space Situational Awareness support  MDSC efforts related to STSS include: - Analyze space radiation environment and its influence on MDA space system performance - Analyze space based sensor data from STSS and OPIR observations, both individually and combined, to identify phenomenology and techniques to aid future tracking and discrimination architectures - Provide data for concept studies and analyses for alternative sensor payload configurations - Sustain MDSC resources for all participant activities, including data, voice, and/or video communications, and support MDA Cyber Security directives - Document requirements and perform tracking, design, implementation, and verification necessary for the MDSC facility - Implement emerging cyber security requirements				

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency									Date: February 2018		
Appropriation/Budget Activity 0400 / 4				R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2017	FY 2018	FY 2019
Specific and/or unique accomplishments to each FY are as follows:											
FY 2018 Plans: - SEE ABOVE.											
FY 2019 Plans: - SEE ABOVE.											
FY 2018 to FY 2019 Increase/Decrease Statement: N/A											
Accomplishments/Planned Programs Subtotals									0.000	32.015	32.217
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 0603882C: Ballistic Missile Defense Midcourse Defense Segment	1,034.861	957.097	926.359	-	926.359	1,046.235	847.537	585.956	572.619	Continuing	Continuing
• 0603884C: Ballistic Missile Defense Sensors	252.665	278.145	220.876	-	220.876	250.238	267.502	263.758	260.273	Continuing	Continuing
• 0603890C: BMD Enabling Programs	435.203	465.642	540.926	-	540.926	542.326	608.210	489.637	496.313	Continuing	Continuing
• 0603892C: AEGIS BMD	889.489	860.788	767.539	-	767.539	780.085	707.901	693.256	562.748	Continuing	Continuing
• 0603896C: Ballistic Missile Defense Command and Control, Battle Management & Communication	465.433	454.862	475.168	-	475.168	515.239	494.873	492.119	515.529	Continuing	Continuing
• 0603904C: Missile Defense Integration and Operations Center (MDIOC)	53.483	53.265	54.925	-	54.925	58.498	57.764	59.020	61.915	Continuing	Continuing
• 0603914C: Ballistic Missile Defense Test	294.441	316.193	365.681	-	365.681	349.388	320.909	320.332	327.584	Continuing	Continuing
• 0603915C: Ballistic Missile Defense Targets	521.784	460.125	517.852	-	517.852	441.827	383.739	405.909	417.800	Continuing	Continuing

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Missile Defense Agency										<b>Date:</b> February 2018	
<b>Appropriation/Budget Activity</b> 0400 / 4				<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>				<b>Project (Number/Name)</b> MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
			<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Complete</u>	<u>Total Cost</u>
• 1206895C: <i>Ballistic Missile Defense System Space Programs</i>	0.000	30.994	16.484	-	16.484	19.555	19.097	17.888	18.236	Continuing	Continuing
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
<p>The STSS demonstration satellites program follows MDAs capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS) with the subcontractor Raytheon providing the sensor payload. This contract implements MDA's capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the BMDS.</p> <p>MDSC efforts will be acquired on the Integrated Research and Development for Enterprise Solutions contract vehicle. This contract is responsible for integrating Research, Development, Test and Evaluation, operations support, resource and infrastructure management for the MDSC. Through various uses of incentives upon the requirement objectives, the contractor provides customer support while striving to achieve efficiencies through approaches that meet or exceed customer requirements.</p>											
<b>E. Performance Metrics</b>											
N/A											

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Missile Defense Agency												Date: February 2018			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites - Capability Based R&D	SS/CPAF	NGAS : Redondo Beach, CA, Schriever AFB, CO	0.000	0.000		20.066	Nov 2017	20.279	Nov 2018	-		20.279	Continuing	Continuing	Continuing
Demonstration Satellites - STSS Support to Missile Defense Space Center (MDSC)	C/TBD	TBD : Schriever AFB, CO	0.000	0.000		3.893	Nov 2017	3.733	Nov 2018	-		3.733	Continuing	Continuing	Continuing
Demonstration Satellites - Systems Engineering	FFRDC	Aerospace : Los Angeles, CA	0.000	0.000		0.278	Nov 2017	0.284	Nov 2018	-		0.284	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		24.237		24.296		-		24.296	Continuing	Continuing	N/A
Remarks															
All efforts listed above are a continuation of PE 0603893C, MD12															
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites - Contract Support Services (CSS)	C/Various	MDA : AL, CO	0.000	0.000		3.197	Nov 2017	3.361	Nov 2018	-		3.361	Continuing	Continuing	Continuing
Demonstration Satellites - IT User Services	C/CPAF	Northrop Grumman/ Jacobs Engineering : AL, AK, CA, CO, HI, NM, VA	0.000	0.000		0.618	Dec 2017	0.628	Dec 2018	-		0.628	Continuing	Continuing	Continuing
Demonstration Satellites - MDA Civilian	Allot	MDA : Schriever AFB, CO	0.000	0.000		3.072	Oct 2017	3.108	Oct 2018	-		3.108	Continuing	Continuing	Continuing
Demonstration Satellites - Other Government Agency (OGA) Civilian	MIPR	SMC : Schriever AFB, CO	0.000	0.000		0.162	Nov 2017	0.164	Nov 2018	-		0.164	Continuing	Continuing	Continuing
Demonstration Satellites - Program Mission Support	Various	Various : Various	0.000	0.000		0.310	Nov 2017	0.232	Nov 2018	-		0.232	Continuing	Continuing	Continuing

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Missile Defense Agency												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 0400 / 4						<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>						<b>Project (Number/Name)</b> MD12 / <i>Space Tracking and Surveillance System (STSS)</i>			
<b>Support (\$ in Millions)</b>				<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Demonstration Satellites - UARC	C/CPFF	Utah University, Space Dynamics Laboratory : AL, AK, CA, CO, HI, MA, UT, VA	0.000	0.000		0.419	Nov 2017	0.428	Nov 2018	-		0.428	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		7.778		7.921		-		7.921	Continuing	Continuing	N/A
<b>Remarks</b> All efforts listed above are a continuation of PE 0603893C, MD12															
			<b>Prior Years</b>	<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			0.000	0.000		32.015		32.217		-		32.217	Continuing	Continuing	N/A
<b>Remarks</b> N/A															



# UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency															Date: February 2018																	
Appropriation/Budget Activity										R-1 Program Element (Number/Name)										Project (Number/Name)												
0400 / 4										PE 1206893C / Space Tracking and Surveillance System (STSS)										MD12 / Space Tracking and Surveillance System (STSS)												
Significant Event Complete ▲					Milestone Decision Complete ★					Element Test Complete ◆					System Level Test Complete ●					Complete Activity ◆												
Significant Event Planned △					Milestone Decision Planned ☆					Element Test Planned ◇					System Level Test Planned ○					Planned Activity ◇												
										FY 2017			FY 2018			FY 2019			FY 2020			FY 2021			FY 2022			FY 2023				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018														△																		
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018														◇	◇	◇	◇															
MIS Operations - 1Q2018-4Q2018														◇	◇	◇	◇															
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018														◇	◇	◇	◇															
MDSC TIL Operations - 1Q2018-4Q2018														◇	◇	◇	◇															
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018														△																		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018															△																	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018																△																
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019																	△															
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019																	◇	◇	◇	◇												
MIS Operations - 1Q2019-4Q2019																	◇	◇	◇	◇												
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019																	◇	◇	◇	◇												
MDSC TIL Operations - 1Q2019-4Q2019																	◇	◇	◇	◇												
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019																		△														
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019																			△													
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019																				△												
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020																				△												
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020																				◇	◇	◇	◇									
MIS Operations - 1Q2020-4Q2020																				◇	◇	◇	◇									
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020																				◇	◇	◇	◇									
MDSC TIL Operations - 1Q2020-4Q2020																				◇	◇	◇	◇									
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020																					△											
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020																						△										
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020																							△									

**UNCLASSIFIED**

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency												Date: February 2018											
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)					Project (Number/Name) MD12 / Space Tracking and Surveillance System (STSS)													
Significant Event Complete ▲ Significant Event Planned △		Milestone Decision Complete ★ Milestone Decision Planned ☆		Element Test Complete ◆ Element Test Planned ◇		System Level Test Complete ● System Level Test Planned ○		Complete Activity ◆ Planned Activity ◇															
					FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021														△									
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
MIS Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021														◇	◇	◇	◇						
MDSC TIL Operations - 1Q2021-4Q2021														◇	◇	◇	◇						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021															△								
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021																△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021																△							
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022																	△						
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
MIS Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
Mission Planning, Tasking and Analysis - 1Q2022-4Q2022																◇	◇	◇	◇				
MDSC TIL Operations - 1Q2022-4Q2022																◇	◇	◇	◇				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2022																	△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2022																	△						
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2022																		△					
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2023																			△				
STSS Demonstration Satellites On-Orbit Operations - 1Q2023-4Q2023																		◇	◇	◇	◇		
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2023																			△				
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2023																				△			
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2023																					△		

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Missile Defense Agency			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	<b>Project (Number/Name)</b> MD12 / <i>Space Tracking and Surveillance System (STSS)</i>	

**Schedule Details**

<b>Events</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2018	1	2018	1	2018
STSS Demonstration Satellites On-Orbit Operations - 1Q2018-4Q2018	1	2018	4	2018
MIS Operations - 1Q2018-4Q2018	1	2018	4	2018
Mission Planning, Tasking and Analysis - 1Q2018-4Q2018	1	2018	4	2018
MDSC TIL Operations - 1Q2018-4Q2018	1	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2018	2	2018	2	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2018	3	2018	3	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2018	4	2018	4	2018
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2019	1	2019	1	2019
STSS Demonstration Satellites On-Orbit Operations - 1Q2019-4Q2019	1	2019	4	2019
MIS Operations - 1Q2019-4Q2019	1	2019	4	2019
Mission Planning, Tasking and Analysis - 1Q2019-4Q2019	1	2019	4	2019
MDSC TIL Operations - 1Q2019-4Q2019	1	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2019	2	2019	2	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2019	3	2019	3	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2019	4	2019	4	2019
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2020	1	2020	1	2020
STSS Demonstration Satellites On-Orbit Operations - 1Q2020-4Q2020	1	2020	4	2020
MIS Operations - 1Q2020-4Q2020	1	2020	4	2020
Mission Planning, Tasking and Analysis - 1Q2020-4Q2020	1	2020	4	2020
MDSC TIL Operations - 1Q2020-4Q2020	1	2020	4	2020
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2020	2	2020	2	2020

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Missile Defense Agency				<b>Date:</b> February 2018	
<b>Appropriation/Budget Activity</b> 0400 / 4		<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>		<b>Project (Number/Name)</b> MD12 / <i>Space Tracking and Surveillance System (STSS)</i>	
		<b>Start</b>		<b>End</b>	
<b>Events</b>	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2020	3	2020	3	2020	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2020	4	2020	4	2020	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2021	1	2021	1	2021	
STSS Demonstration Satellites On-Orbit Operations - 1Q2021-4Q2021	1	2021	4	2021	
MIS Operations - 1Q2021-4Q2021	1	2021	4	2021	
Mission Planning, Tasking and Analysis - 1Q2021-4Q2021	1	2021	4	2021	
MDSC TIL Operations - 1Q2021-4Q2021	1	2021	4	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2021	2	2021	2	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2021	3	2021	3	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2021	4	2021	4	2021	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2022	1	2022	1	2022	
STSS Demonstration Satellites On-Orbit Operations - 1Q2022-4Q2022	1	2022	4	2022	
MIS Operations - 1Q2022-4Q2022	1	2022	4	2022	
Mission Planning, Tasking and Analysis - 1Q2022-4Q2022	1	2022	4	2022	
MDSC TIL Operations - 1Q2022-4Q2022	1	2022	4	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2022	2	2022	2	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2022	3	2022	3	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2022	4	2022	4	2022	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 1Q2023	1	2023	1	2023	
STSS Demonstration Satellites On-Orbit Operations - 1Q2023-4Q2023	1	2023	4	2023	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 2Q2023	2	2023	2	2023	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 3Q2023	3	2023	3	2023	
STSS Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity - 4Q2023	4	2023	4	2023	

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MC12 / Cyber Operations			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MC12: Cyber Operations	-	0.000	1.336	2.997	-	2.997	1.359	0.340	0.340	0.446	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note N/A												
A. Mission Description and Budget Item Justification Space Tracking and Surveillance System (STSS) Cyber Operations sustain the Missile Defense Agency (MDA) Risk Management Framework (RMF) and Security Controls Assessments (SCA)/Controls Validation Testing (CVT) activities, analysis of validation results, risk assessments and reviews of proposed Program Manager/ Information System Security Manager (PM/ISSM) Plans of Action and Milestones (POA&Ms) for MDA STSS mission systems. Activities in this Project are necessary to comply with the Federal Information Security Management Act (FISMA).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2017	FY 2018	FY 2019	
Title: Network/System Certification and Accreditation (C&A)  Articles:  Description: This activity maintains the Assessment and Authorization (A&A) and C&A data repository, capturing the RMF documentation (artifacts, validation results, and Information Assurance Risk Assessment results, and Designated Approving Authority (DAA) accreditation decisions) and POA&Ms on all MDA information systems. This activity prepares and submits C&A documentation and accreditation recommendations to the MDA Chief Information Officer (CIO) /Certification Authority and the DAA. Independent Verification and Validation team actions ensure the availability, integrity, authentication, confidentiality, and non-repudiation of the MDA mission, test, and administrative systems. Recurring accomplishments include the following: - Monitor and track cybersecurity and mitigations detailed in Information Technology security POA&Ms - Conduct cybersecurity design, engineering, and architecture planning for STSS information technology systems - Plan and test the cybersecurity controls for STSS and MDSC systems - Conduct SCA testing continuous monitoring of STSS and MDSC mission systems and provide POA&Ms to mitigate cybersecurity vulnerabilities  Specific and/or unique accomplishments to each FY are as follows:  FY 2018 Plans:									0.000	1.336	2.997	
									-	-	-	

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Missile Defense Agency		<b>Date:</b> February 2018	
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	<b>Project (Number/Name)</b> MC12 / <i>Cyber Operations</i>	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>		<b>FY 2017</b>	<b>FY 2018</b>
- SEE ABOVE.			
<b>FY 2019 Plans:</b> - Initiates STSS system hardware replacement for cyber security requirements compliance			
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> - Increase from FY 2018 to FY 2019 reflects initiation of hardware replacement to meet cyber security requirements			
<b>Accomplishments/Planned Programs Subtotals</b>		0.000	1.336
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A			
<b>Remarks</b>			
<b>D. Acquisition Strategy</b> N/A			
<b>E. Performance Metrics</b> N/A			

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Missile Defense Agency												Date: February 2018			
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MC12 / Cyber Operations					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Network/System Certification and Accreditation (C&A) - Civ Cyber Labor	Allot	MDA : Various	0.000	0.000		0.165	Oct 2017	0.179	Oct 2018	-		0.179	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Contractor Support	C/Various	MDA : AL, CO	0.000	0.000		0.000		0.218	Nov 2018	-		0.218	Continuing	Continuing	Continuing
Network/System Certification and Accreditation (C&A) - Information Assurance	C/CPAF	NGAS : Schriever AFB, CO/Redondo Beach, CA	0.000	0.000		1.171	Nov 2017	2.600	Nov 2018	-		2.600	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.336		2.997		-		2.997	Continuing	Continuing	N/A
Remarks N/A															
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		1.336		2.997		-		2.997	Continuing	Continuing	N/A
Remarks N/A															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency														Date: February 2018									
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>								Project (Number/Name) MC12 / <i>Cyber Operations</i>									
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●						Complete Activity ◆											
Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○						Planned Activity ◇											
						FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023					
MC12 Cyber Operations									◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇			



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Missile Defense Agency			Date: February 2018
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	Project (Number/Name) MC12 / <i>Cyber Operations</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MC12 Cyber Operations	1	2018	4	2023

**UNCLASSIFIED**

Exhibit R-2A, RDT&E Project Justification: PB 2019 Missile Defense Agency										Date: February 2018		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)				Project (Number/Name) MD40 / Program-Wide Support			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
MD40: Program-Wide Support	-	0.000	1.556	1.741	-	1.741	1.621	1.606	1.701	1.701	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note Beginning in FY 2018, Program Wide Support (PWS) was proportionately reallocated as a result of the Space Tracking and Surveillance System transfer from 0603893C Program Element. FY 2019 and out reflects proportional changes as a result of budget changes to this program element.												
A. Mission Description and Budget Item Justification PWS contains non-headquarters management costs in support of MDA functions and activities across the entire BMDS. It Includes Government Civilians, and Contract Support Services. This provides integrity and oversight of the BMDS as well as supports MDA in the development and evaluation of technologies that will respond to the changing threat. Additionally, PWS includes Global Deployment personnel and support performing deployment site preparation and activation and, provides facility capabilities for MDA Executing Agent locations. Other MDA wide costs includes: physical and technical security; civilian drug testing; audit readiness; the Science, Technology, Engineering, and Mathematics (STEM) program; legal services and settlements; travel and agency training; office, equipment, vehicle, and warehouse leases; utilities and base operations; data and unified communications support; supplies and maintenance; materiel and readiness and central property management of equipment; and similar operating expenses. PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the adjusted RDT&E profile (which excludes: 0305103C Cyber Security Initiative, 0603274C Special Programs, 0603913C Israeli Cooperative Program and 0901598C Management Headquarters).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2017	FY 2018	FY 2019	
Title: Program Wide Support  Articles:  Description: N/A  FY 2018 Plans: N/A  FY 2019 Plans: N/A  FY 2018 to FY 2019 Increase/Decrease Statement: N/A									0.000	1.556	1.741	
									-	-	-	
Accomplishments/Planned Programs Subtotals									0.000	1.556	1.741	

UNCLASSIFIED

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Missile Defense Agency		<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	<b>Project (Number/Name)</b> MD40 / <i>Program-Wide Support</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A		
<b>Remarks</b>		
<b>D. Acquisition Strategy</b> N/A		
<b>E. Performance Metrics</b> N/A		

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2019 Missile Defense Agency												<b>Date:</b> February 2018			
<b>Appropriation/Budget Activity</b> 0400 / 4						<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>						<b>Project (Number/Name)</b> MD40 / <i>Program-Wide Support</i>			
<b>Support (\$ in Millions)</b>				<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Wide Support - Agency Operations Management	C/CPAF	Various : Multi: AL, CA, CO, VA	0.000	0.000		0.208	Jul 2018	0.409	Jul 2019	-		0.409	Continuing	Continuing	Continuing
Program Wide Support - Agency Operations and Support Services	C/CPAF	Northrop Grumman : CO	0.000	0.000		1.348	Jan 2018	1.332	Aug 2019	-		1.332	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		1.556		1.741		-		1.741	Continuing	Continuing	N/A
<b>Remarks</b> N/A															
			<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>			0.000	0.000		1.556		1.741		-		1.741	Continuing	Continuing	N/A
<b>Remarks</b> N/A															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Missile Defense Agency														Date: February 2018									
Appropriation/Budget Activity 0400 / 4						R-1 Program Element (Number/Name) PE 1206893C / Space Tracking and Surveillance System (STSS)								Project (Number/Name) MD40 / Program-Wide Support									
Significant Event Complete ▲		Milestone Decision Complete ★		Element Test Complete ◆		System Level Test Complete ●				Complete Activity ◆													
Significant Event Planned △		Milestone Decision Planned ☆		Element Test Planned ◇		System Level Test Planned ○				Planned Activity ◇													
						FY 2017		FY 2018		FY 2019		FY 2020		FY 2021		FY 2022		FY 2023					
MD40 Program-Wide Support										◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Missile Defense Agency			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 1206893C / <i>Space Tracking and Surveillance System (STSS)</i>	<b>Project (Number/Name)</b> MD40 / <i>Program-Wide Support</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MD40 Program-Wide Support	1	2018	4	2023